

IN THE CLAIMS:

Please amend the claims as follows. Please delete Claims 2-24 and replace them with the following new Claims 25 - 58.

--25. An isolated nucleic acid encoding a plant phosphomevalonate kinase, selected from the group consisting of:

- (a) the sequence in accordance with SEQ ID NO: 1,
- (b) sequences which encode a polypeptide which encompasses the amino acid sequence in accordance with SEQ ID NO: 2,
- (c) partial sequences of the sequences defined under (a) or (b) which have a length of at least 14 base pairs,
- (d) sequences which hybridize with the sequences defined under (a) or (b) at a hybridization temperature of 35-52°C,
- (e) sequences which have at least 70% identity with the sequences defined under (a) or (b),
- (f) sequences which are complementary to the sequences defined under a) or b), and
- (g) sequences which, owing to the degeneracy of the genetic code, encode the same amino acid sequence as the sequences defined under a) to e).

26. An isolated nucleic acid according to Claim 25, selected from the group consisting of:

- (a) the sequence in accordance with SEQ ID NO: 1,
- (b) sequences which encode a polypeptide which encompasses the amino acid sequence in accordance with SEQ ID NO: 2,
- (c) sequences which are complementary to the sequences defined under a) or b), and
- (d) sequences which, owing to the degeneracy of the genetic code, encode the same amino acid sequence as the sequences defined under a) to c).

27. A DNA construct encompassing a nucleic acid according to Claim 25 and a heterologous promoter.

28. A DNA construct encompassing a nucleic acid according to Claim 26 and a heterologous promoter.

29. A vector encompassing a nucleic acid according to Claim 25.

30. A vector encompassing a nucleic acid according to Claim 26.

31. A vector encompassing a DNA construct according to Claim 27.

32. A vector encompassing a DNA construct according to Claim 29.

33. A vector according to Claim 29, characterized in that the nucleic acid is linked functionally to regulatory sequences which ensure expression of the nucleic acid in pro- or eukaryotic cells.

34. Vector according to Claim 30, characterized in that the nucleic acid is linked functionally to regulatory sequences which ensure expression of the nucleic acid in pro- or eukaryotic cells.

35. A host cell comprising a nucleic acid according to Claim 25.

36. A host cell comprising a DNA construct according to Claim 27.

37. A host cell comprising a vector according to Claim 29.

38. A host cell according to Claim 35, characterized in that it is a prokaryotic cell.

39. A host cell according to Claim 35, characterized in that it is a eukaryotic cell.

40. An isolated polypeptide with the biological activity of a phosphomevalonate kinase which is encoded by a nucleic acid according Claim 25.
41. An isolated polypeptide with the biological activity of a phosphomevalonate kinase which is encoded by a nucleic acid according Claim 26.
42. An isolated polypeptide with the biological activity of a phosphomevalonate kinase which encompasses an amino acid sequence with at least 70% identity with the sequence in accordance with SEQ ID NO: 2.
43. An antibody which binds specifically to a polypeptide according to Claim 40.
44. An antibody which binds specifically to a polypeptide according to Claim 41.
45. A method of generating a nucleic acid according to Claim 25, comprising a step selected from:
 - (a) chemically synthesizing the nucleic acid,
 - (b) chemical synthesizing oligonucleotides, labeling of the oligonucleotides, hybridizing of the oligonucleotides with DNA of a genomic or cDNA library which had been generated starting from genomic DNA or mRNA from plant cells, selecting positive clones, and isolating the hybridizing DNA from positive clones, and
 - (c) chemical synthesizing oligonucleotides and amplifying the target DNA using PCR.
46. A method of generating a polypeptide with the biological activity of a phosphomevalonate kinase which is encoded by a nucleic acid according to Claim 1, comprising:
 - (a) culturing a host cell comprising a nucleic acid according to Claim 25 under conditions which ensure expression of the nucleic acid according to Claim 25, and

- (b) obtaining the polypeptide from the host cell or the culture medium

47. A method of generating a polypeptide with the biological activity of a phosphomevalonate kinase which is encoded by a nucleic acid according to Claim 25, comprising

- (a) expressing a nucleic acid according to Claim 25 in an *in-vitro* system, and
- (b) obtaining the polypeptide from the *in-vitro* system.

48. A method of finding a chemical compound which binds to a polypeptide with the biological activity of a phosphomevalonate kinase which is encoded by a nucleic acid according to Claim 25 and/or modulates the activity of this polypeptide, encompassing the following steps:

- (a) contacting a host cell comprising a nucleic acid according to Claim 25 or a polypeptide with the biological activity of a phosphomevalonate kinase which is encoded by a nucleic acid according to Claim 25 with a chemical compound or a mixture of chemical compounds under conditions which permit the interaction of a chemical compound with the polypeptide, and
- (b) comparing the biological activity of the polypeptide in the presence of a chemical compound or a mixture of chemical compounds with the biological activity of the polypeptide in the absence of a chemical compound or a mixture of chemical compounds, and
- (C) determining the chemical compound which specifically binds to the polypeptide and/or specifically modulates the biological activity of the polypeptide.

49. A method of finding a compound which modifies the expression of polypeptide with the biological activity of a phosphomevalonate kinase which is encoded by a nucleic acid according to Claim 25, comprising:

- (a) contacting a host cell comprising a nucleic acid according to Claim 25 with a chemical compound or a mixture of chemical compounds,
- (b) determining the polypeptide concentration, and

(c) determining the compound which specifically affects the expression of the polypeptide.

50. A modulator which is identified by a method according to Claim 48.

51. A modulators which is identified by a method according to Claim 48.

52. A herbicidally active substance which is found by a method according to Claim 48.

53. A herbicidally active substance which is found by a method according to Claim 49.

54. An isolated nucleic acid encoding a plant phosphomevalonate kinase, with the exception of the nucleic acid fragments in accordance with SEQ ID NO: 3, 4 and 5.

55. An isolated nucleic acid according to Claim 54, wherein the isolated nucleic acid encodes an *A. thaliana* phosphomevalonate kinase.

56. An isolated nucleic acid according to Claim 54, wherein the isolated nucleic acid is a single-stranded or double-stranded DNA or RNA.

57. An isolated nucleic acid according to Claim 54, wherein the isolated nucleic acid is a fragment of genomic DNA or cDNA.

58. An isolated nucleic acid according to Claim 54, wherein the isolated nucleic acid is derived from *A. thaliana*.--